

ABSTRACT

An inline bitumen froth steam heater system is comprised of steam injection and static mixing devices. The steam heater system heats and de-aerates an input bitumen froth without creating downstream processing problems with the bitumen froth such as emulsification or live steam entrainment. The inline bitumen froth steam heater is a multistage unit that injects and thoroughly mixes the steam with bitumen resulting in an output bitumen material having a homogenous temperature of about 190°F. The heating system conditions a superheated steam supply to obtain saturated steam at about 300°F. The saturated steam is contacted with a bitumen froth flow and mixed in a static mixer stage. The static mixers provide a surface area and rotating action that allows the injected steam to condense and transfer its heat to the bitumen froth. The mixing action and the increase in temperature of the bitumen froth results in reduction in bitumen viscosity and also allows the release of entrapped air from the bitumen froth.